



Environment, Health & Safety Division

January 10, 2007

DIR-07-013

To: James Siegrist
Physics Division Director

From: Howard K. Hatayama *H*
Environment, Health and Safety Division Director

Subject: 2006 Physics Division Integrated Functional Appraisal

The Environment, Health and Safety Division conducted a triennial Integrated Functional Appraisal (IFA) of the Physics Division during June and July 2006. The IFA team focused on work that involves higher or special hazards, formal authorizations, and permits.

The Physics Division 2006 IFA Report is enclosed. It presents the IFA results and a description of the appraisal process.

In general, the Physics Division operations assessed conform to Integrated Safety Management principals, adhere to the conditions of the applicable authorization or permit, and operate in a safe and compliant manner. Three Noteworthy practices were documented. The several Findings (issues found not to comply with standard or policy) and Observations noted were of a low hazard nature. Some were institutional in nature. Recommendations are provided in each case. IFA findings are to be tracked to completion in the Lab's Corrective Action Tacking System.

Your IFA Team Leader, Marty White, is available to answer any questions (x7663).

cc: Noel Gorman
Marty White

Lawrence Berkeley National Laboratory

Physics Division



2006 Integrated Functional Appraisal

IFA Team Members

	<u>Signature</u>	<u>Date</u>
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Executive Summary

The Integrated Functional Appraisal (IFA) is a key component of Lawrence Berkeley National Laboratory's (LBNL's) integrated safety management (ISM) system, and forms one of the three tiers of LBNL's Environment, Safety and Health (ES&H) self-assessment program. The Environment, Health and Safety (EH&S) Division conducts an IFA for each Laboratory division every three years. Preparation for the 2006 Physics IFA began in March, 2006. Inspections began June 5, 2006 and were completed by close of business on July 17, 2006.

The purpose of the IFA is to conduct a technical environmental and occupational safety and health audit and physical inspection of a division's hazardous operations, and the controls and programs used to mitigate the identified hazards. The Physics Division appraisal evaluated compliance with federal, state and local regulation, and with LBNL policy. This report provides details of the appraisal results and offers corrective action and improvement recommendations to the Division as appropriate. The IFA process also provides an Operational Awareness window for LBNL's Berkeley Site Office DOE program liaisons.

The primary focus of the appraisal was directed toward work conducted under formal authorizations and hazardous work permits. The Physics Division has two Activity Hazard Documents (AHDs), one inactive Radiological Work Authorization (RWA), three Sealed Source Authorizations (SSAs), two Low Activity Source Authorizations (LSAs), and six Satellite Accumulation Areas (SAAs). These listed formal authorizations were the focus of the Physics IFA inspections. All areas were found to be in good compliance, with the hazards well documented and marked. In the course of the appraisal two researchers were interviewed. Both of these personnel displayed a deep understanding of the formal work authorizations and the hazards present.

The IFA team found 6 findings and 7 observations in addition to 3 noteworthy practices. The results and observations are noted in detail in Appendix E. The noteworthy practices are described in detail in Section 3.2.1. The findings, observations and noteworthy practices are summarized below.

Type	Authorization	Issue
Finding	AHD 2014	Respirator training expired
Finding	AHD 2014 & AHD GS1002	Fire Department lacks training on AHD hazards
Finding	AHD 2014	Electrical panels lack 3' clearance in front
Finding	AHD 2014	Electrical panels missing screws
Finding	AHD 2014	Fire extinguisher not serviced since 2004
Finding	AHD 2014	Unanchored shelf over 3' tall
Observation	AHD 2014	Researcher solders (rarely) and has no lead awareness training
Observation	AHD GS1002	AHD includes gas no longer used
Observation	AHD 2014	Personnel use face shield but not goggles when adding chemicals to baths
Observation	AHD 2014	Difficult access to HVAC area
Observation	AHD 2014	Dangling light fixture and uncovered junction box in ceiling area
Observation	AHD 2014	Access and egress signage could be improved
Observation	AHD 2014 & AHD GS1002	Little assurance of subcontractors doing safe work
Noteworthy practice	SSA 111	On-the job training and documentation
Noteworthy practice	AHD 2014 & AHD GS1002	On-the job training and documentation
Noteworthy practice	AHD 2014	Use of Chemical Management System to determine need to order chemicals

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1 Introduction

The Integrated Functional Appraisal (IFA) is a key component of Lawrence Berkeley National Laboratory's (LBNL's) integrated safety management (ISM) system, and forms one of the three tiers of LBNL's Environment, Safety and Health (ES&H) self-assessment program. The Environment, Health and Safety (EH&S) Division conducts an IFA for each Laboratory division every three years. Preparation for the 2006 Physics IFA began in March, 2006. Inspections began June 5, 2006 and were completed by close of business on July 17, 2006.

1.1 Laboratory Management IFA Oversight

The EH&S Division and Office of Contract Assurance jointly oversee the implementation of the IFA. In response to changing Laboratory program audit needs, a steering committee was formed to assure that maximum audit effectiveness is achieved. The IFA Steering Committee members are listed in Figure 1.

Figure 1 2006 IFA Steering Committee

Member	LBNL Organization
Michelle Flynn	Office of Contract Assurance (OCA) – Chair
John Chernowski	OCA
Paul Blodgett	EH&S - Industrial Hygiene
Jack Salazar	EH&S – Liaison Coordinator
Richard DeBusk	EH&S - Occupational Safety
Ross Fisher	EH&S - IFA Coordinator

Some restructuring of the IFA process has been initiated whereby:

- The IFA team leader field guidance and IFA report template previously provided as separate documents have been combined into one document
- The IFA will include hazardous work¹ program compliance
- Line management authorized work and non-technical work are de-emphasized
- Details of formal work authorizations and hazardous work permits will be audited

¹ Work conducted under special hazardous work authorization or permits such as lock-out-tag-out, energized work, confined space work, surface penetration, fire safety, hoisting and rigging activities, ultra-centrifuge use, etc.

- IFA team leaders will gain Steering Committee approval of an appraisal plan before performing the IFA
- The IFA report will be reviewed by the Steering Committee prior to final acceptance by the IFA Coordinator
- Training will be provided for IFA leaders and their teams
- EH&S Liaisons will be allowed the opportunity to lead IFA teams for a division other than their assigned division

1.2 IFA Purpose

The purpose of the IFA is to conduct a technical environmental and occupational safety and health audit and physical inspection of a division's hazardous operations, and the controls and programs used to mitigate the identified hazards. The Physics Division appraisal evaluated compliance with federal, state and local regulation, and with LBNL policy. This report provides details of the appraisal results and offers corrective action and improvement recommendations to the Division as appropriate. The IFA process also provides an Operational Awareness window for LBNL's Berkeley Site Office DOE program liaisons.

1.3 Scope

The primary focus of the appraisal is directed toward work conducted under formal authorizations and hazardous work permits. The Physics Division has two Activity Hazard Documents (AHDs), one inactive Radiological Work Authorization (RWA), three Sealed Source Authorizations (SSAs), two Low Activity Source Authorizations (LSAs), and six Satellite Accumulation Areas (SAAs). These listed formal authorizations were the focus of the Physics IFA inspections.

2 Appraisal Process

2.1 Team

2.1.1 Team selection

IFA team members were selected to match personnel expertise with the nature of the issues and hazards to be evaluated in the division. In addition, the team members selected are familiar with the Physics Division. The hazards expected for the authorizations are chemical waste, chemical product, electrical, physical, and radioactive. The team included the following members:

- Marty White (Team Leader), Waste Management

- Ron Madaras, Physics Safety Coordinator
- Betsy MacGowan, Industrial Hygiene
- Christine Donahue, Health Physics
- Tom Caronna, Electrical Safety
- Matt Kotowski, Safety
- John Muhlestein, DOE Observer.

2.1.2 Team member roles and responsibilities

The IFA team leader was responsible for the following: compiling the IFA team; managing the retrieval of all pertinent documents; defining the scope of the IFA with the assistance of the division safety coordinator; coordinating meetings; communicating results to the appraised division; and preparing the IFA report. The IFA team member Subject Matter Experts (SMEs) were responsible for reviewing applicable documents with respect to their field of expertise. All team members were responsible for reporting any ES&H concerns they identify, regardless of their field of expertise. The Health Physics SME and IFA team leader were responsible for inspecting the radioactive authorizations. The Physics Safety Coordinator, Industrial Hygiene SME, Electrical Safety SME, Safety SME, and IFA team leader were responsible for inspecting the AHDs. John Muhlestein, the DOE Observer was invited to participate in the planning meeting and inspections. The Waste Management SME (IFA team leader) was responsible for inspecting the SAs.

2.1.3 Team meetings

There were several discussions between the Physics Safety Coordinator and the Physics IFA team leader. The topics included identification of hazards and formal authorizations in Physics. Following these discussions, the planning meetings were held.

For the inspections involving radioactive material authorizations, a planning meeting was held with the Health Physics SME, and IFA team leader. At this meeting the authorizations were reviewed. Also discussed was the documentation related to the authorizations that Principal Investigators (PIs) are expected to maintain. The timing of the inspection was discussed.

The AHD authorizations involve work with no radioactive hazards. Thus, for the AHD authorizations, a planning meeting was held with the entire team except for the Health Physics SME. At this meeting first the scope and purpose of the IFA was discussed. Then the two AHDs were

reviewed. In addition, team member roles were discussed at the meeting. The timing of the inspection was discussed.

2.2 Planning the Appraisal

2.2.1 Documentation and database reviews

Prior to the planning session, the following institutional program documents, policies and procedures, formal authorizations and hazardous work permits were reviewed:

General Information

- Division ISM Plan
- PUB 5344, LBNL EH&S Self-Assessment Program
- PUB 3000, Chapter 6, Safe Work Authorization
- PUB 3000, Chapter 21, Radiation Safety
- PUB 3093 Waste Accumulation Guidelines
- PUB 3000, Chapters pertaining to Hazardous Work Permits

Formal Work Authorizations

- Activity Hazard Documents (AHDs)
- Radiological Work Authorizations (RWAs)
- Sealed Source Authorizations (SSAs)
- Low Activity Source Authorizations (LSAs)

Hazardous Work Authorizations and Permits

- Waste Management Group information on Satellite Accumulation Areas (SAAs)

To confirm that all hazardous authorizations were included the Physics IFA team leader also reviewed the HEAR database and discussed hazardous operations with the Physics Safety Coordinator. It was confirmed with the appropriate SMEs that Physics does not have any facility permits /authorizations, formal work authorizations, or hazardous work authorization/permits other than the ones listed in Appendix B.

2.2.2 Identification of operations

From the Documentation and database review the following formal authorization were identified in Physics:

- Formal Work Authorizations
 - AHD 2014: LAM Research Model 4400 Plasma Etch System; 70A Microsystems Laboratory
 - AHD GS1002; Microsystems Laboratory Furnace Systems; 70A Microsystems Laboratory
 - RWA 1150; 9/27/05; 50B-6209 (Inactive)
 - SSA 111; 2/6/06; 50B-6209

- SSA 115; 2/14/06; 50A-2155
- SSA 212; 3/8/05; 50A-2155
- LAS L002; 3/14/06; 50B-6209, 50B-6216; 50B-6238, 50A-6114
- LAS L023; 2/6/06; 006-BTS, 50A-2155
- Hazardous Work Authorizations
 - SAAs in 50-6007, 50-6040, 50A-6238, and Microsystems Laboratory in 70A

Appendix B provides a detail of the permits and authorizations addressed. Those marked “not applicable” were investigated within the context of the Physics Division and determined to be non-applicable. Please refer to Appendix C for the operations and areas inspected.

2.2.3 IFA plan review

The proposed IFA team and planned operations and areas for review received concurrence from the IFA Steering Committee.

2.2.4 Scheduling interviews and field audits

The scheduling of the inspection of the Microprocessing lab had to be coordinated with the PI, Nick Palaio, since the area is a clean room and visitors must be escorted. The IFA team suited up for the inspection. Because of the need to keep lint and dust to a minimum in the clean room, only the IFA team leader took notes during the inspection on special low-lint paper provided by the PI.

2.3 Field Audit

The field audits were conducted with the appropriate team member-SMEs attending. For the SAA review, the Waste Management SME checked the SAAs. The SAAs were checked for completed waste labels, storage time limits, secondary containment where appropriate, compatibility of wastes with containers and with other wastes in the containment, and appropriate signage. Findings and observations were to be noted on an inspection form (blank appendix E form), but since none were found, there was nothing to document. Nick Palaio participated in the inspection of the SAAs in the Microsystems laboratory.

The Health physics SME and IFA team leader conducted most of the radioactive materials authorization inspection. The Physics authorizations reviewed for the IFA are:

SSA	111	(Gilchriese)	-	Weber	until	recently
SSA	115	(Kadel)				
SSA	212	(Battaglia)				
LAS	L002	(Gilchriese)				
LAS	L023	(Battaglia)				

Please note that RWA 1150 (Einsweiler) is an inactive RWA. It was not reviewed in detail.

The inspection of the Microsystems Laboratory area required coordination with the PI since the area is a clean room and visitors must be escorted and suited. Using the IFA Appendix D Field Inspection Guide, the team reviewed the Microsystems Laboratory escorted by Nick Palaio, PI of the area. The IFA team leader took all notes for the team on special low-lint paper provided by the PI. Appendices D and E at the end of this report are completed for this part of the IFA. After the inspection of the Microsystems Laboratory the PI, IFA team leader and Safety Coordinator discussed JHQ training and OJT. As a result of the inspection of the laboratory area and discussions about egress and access with the PI, a second inspection was conducted with the PI, the IFA team leader and Fire Protection SME (Gary Piermattei) which focused on egress and access in the area.

2.4 Interviews

The interview element constitutes a significant part of the IFA process. The purpose is to ensure the division is following its process for assuring work is properly authorized, as described in its ISM plan. During the interviews, the IFA team determined if staff understands the authorization requirements and corresponding hazards. Based on initial interviews, the IFA team determined that additional documentation review and/or interviews were not warranted.

This phase of the IFA included a review of training programs and documentation (including on-the-job training [OJT]). During the interview the team validated Formal Work Authorization-required training and OJT as well as implementation of specially required controls

Two researchers were present during parts of the audit. Tom Weber, Physics, was questioned during the radioactive materials part of the inspection, and Nick Palaio, Engineering matrixed to Physics, was present for part of the SAA inspection and for the entire Microsystems Laboratory inspection. Both of these personnel displayed a deep understanding of the formal work authorizations and the hazards

present. In addition, the OJT conducted and documented for these areas was noteworthy.

2.5 Photographs

Photographs are cataloged in Appendix F and referenced in Appendix E.

3 Reporting Results

Appendix E contains the findings and observations. These findings and observations are summarized below in section 3.2. Noteworthy practices are listed in section 3.2.1.

3.1 Formal Authorization and Hazardous Work Permit Discussion

This section includes a discussion of three topics. First the SAA areas for waste storage are discussed, next the radioactive material authorizations are addressed, and finally the AHD authorizations are discussed.

These SAAs were inspected by the IFA team leader who is a member of the Waste Management Group. Physics Division has 6 SAAs for hazardous waste storage. These SAAs are listed below:

- Building 50, room 6007 (1)
- Building 50, room 6040 (1)
- Building 50A, room 6238 (1)
- Microsystems Laboratory in building 70A (3).

It is noteworthy that all of the SAAs were found to be in compliance during the inspection. In addition, the housekeeping at the SAAs was very good. No other materials were found in the SAAs. The SAAs in the Building 50 complex were empty, and the SAAs in building 70A were not empty, but all wastes were in appropriate containers which were properly labeled, segregated, and contained.

As detailed in Section 2.3, three SSAs and 2 LASs were reviewed and the research areas were inspected. There were no findings or observations, and there was one noteworthy practice. The Health Physics SME had the following comments,

“In summary, all Physics Division authorizations are current and authorized users are trained as required. All areas were properly posted and labeled and housekeeping was excellent. The Physics Division radiation protection authorizations are expertly

maintained and effort to ensure compliance with 10CFR835 and LBNL radiation safety procedures is evident. The Physics Division should be recognized for exhibiting great care and diligence in the control of the radioactive sources and material used and stored. Of particular note, the records and control of the sealed sources maintained under SSA 111 are outstanding!”

The area for both AHDs is the same, so the IFA team inspected the Microsystems Laboratory area only once using the checklist found in Appendix D. The IFA team was very impressed with the Microsystems laboratory. Housekeeping was excellent, the PI was very knowledgeable about his processes and hazards, and he was informed, concerned and proactive about safety. As explained in the following section, the IFA team found two noteworthy practices in the Microsystems Laboratory. Of the six findings found in this area and documented in Appendix E, three are institutional issues. The remaining three are seismic anchoring of a shelf needed, expired respirator training for the PI (note that he has not used a respirator since his training expired), and training for the Fire Department as called out in the AHD. Since the IFA inspection, two of the three shifts in the Fire Department have been trained, and the third shift is scheduled for training on August 10. Of the seven observations found in this area and documented in Appendix E, three are institutional issues. The remaining four observations are recommended lead awareness training for anyone who solders, updating the AHD, the use of goggles in addition to a face shield when pouring chemicals, and improvement of egress and access signs.

3.2 Categorization

Noteworthy practices, findings and observations are discussed below.

3.2.1 *Noteworthy practices*

Three practices were found to be especially noteworthy and have been included in Figure 2. During the inspection of SSA 111 the first noteworthy practice was found, and the Microsystems Laboratory contributed the other two noteworthy practices. All of the practices have applicability for the rest of the lab.

Figure 2 Noteworthy Practices Observed During the 2006 IFA

Item	Practice Observed	Basis	Lab-wide Applicability
1	Rad OJT – Person in charge of providing OJT of SSA 111 in room 6209 has a checklist that he uses for OJT. When the trainee has completed the items on the checklist both the trainer and trainee sign the sheet indicating that the training is complete. This sheet is kept in the file as documentation of the OJT.	This provides an excellent method to document OJT and have assurance that the OJT is consistent from trainee to trainee.	This is an excellent method that could be used lab-wide to document OJT.
2	OJT – PI in charge of Microsystems Lab shows the trainee how to do process once or twice, then watches as the trainee performs the process once or twice, and finally has the trainee write out the process for the PI's review. The PI keeps the written process instructions as documentation of the OJT.	This provides an excellent method to document OJT and have assurance that personnel understand the process.	This is an excellent method that could be used lab-wide to document OJT.
3	CMS – PI in charge of Microsystems Lab uses CMS to determine when to order more process chemicals.	By using CMS to keep an accurate inventory of process chemicals, PI knows when to order more process chemicals without doing a physical check on the inventory.	This is an excellent method to satisfy 2 needs – the need to keep enough chemicals on hand and the need to keep an accurate chemical inventory for EHS purposes.

3.2.2 Findings

Findings are clear cases of practices or conditions that do not comply with regulations or LBNL policy. Findings are deficiencies and must be corrected. Six findings are presented in Appendix E.

3.2.3 Observations

Observations indicate opportunities for improvement. They may be practices and conditions that are not necessarily out of compliance as observed, but could lead to non-compliance under other circumstances from those observed, or if left unaddressed. Observations also reflect practices that, with some additional level of effort, could achieve noteworthy practices status. Seven Observations are presented in Appendix E.

3.3 Recommendations

The findings and observations in Appendix E contain policy and programmatic requirements or code requirements, and corrective action recommendations. For several of these findings and observations the PI was unaware of the condition or recommendation. For example, the PI did not know that IH recommends the use of goggles in addition to a face shield when pouring chemicals into the baths. The PI cannot be expected to be an EHS expert, so reviews such as this one serve a purpose of educating the PI.

Where appropriate these findings and observations have been entered into CATS. The effort needed to correct these varies tremendously, and many are not assigned to the PI for correction. In the case of the AHD-required training of the Fire Department, two of the three shifts have already been trained, and the third shift is scheduled for training on August 10. In light of recent accidents at LBNL and other DOE labs, the IFA team added an observation that in many cases there is little assurance that subcontractors are doing safe work. When the subcontractor is hired because he has expertise the PI lacks, it is difficult for the PI to oversee the safety of the work. This observation has been entered into CATS requesting EH&S management to look into the issue.

4 Corrective Action Tracking and Follow-up

Deficiencies noted during the IFA require corrective action and entry into CATS is required for all deficiencies not immediately resolved. All deficiencies not immediately corrected have already been entered into CATS,

including those identified as institutional. Details of the findings and recommendations can be found in Appendix E.

Two of the noteworthy practices found in Physics concern documentation of OJT. Both of the methods described for OJT documentation are excellent and could be used in other divisions. Documentation of OJT could be strengthened at LBNL and it is recommended that these noteworthy practices be shared with all divisions. The third Noteworthy practice concerns use of CMS. The IFA team lead checked the CMS database and found that it had been updated the day before the inspection. In reviewing this information with the PI, he stated that he uses CMS to track chemicals for ordering purposes in addition to keeping an accurate inventory for regulatory purposes. This is an efficient way to satisfy two needs and it has applicability to the entire lab.

5 Conclusion

The primary focus of the appraisal was directed toward work conducted under formal authorizations and hazardous work permits. The Physics Division has two Activity Hazard Documents (AHDs), one inactive Radiological Work Authorization (RWA), three Sealed Source Authorizations (SSAs), two Low Activity Source Authorizations (LSAs), and six Satellite Accumulation Areas (SAAs). All areas were found to be in good compliance with the hazards well documented and marked. These listed formal authorizations were the focus of the Physics IFA inspections. In the course of the appraisal two researchers were interviewed. Both of these personnel displayed a deep understanding of the formal work authorizations and the hazards present.

The IFA team found 6 findings and 7 observations in addition to 3 noteworthy practices. The results and observations are noted in detail in Appendix E. The noteworthy practices are described in detail in Section 3.2.1. Three of the findings and three of the observations are institutional issues, and the remaining findings and observations are deemed low hazard or best management practice in CATS.

Appendices

Appendix A IFA Team Meetings, Inspections and Interviews

Appendix B IFA Documentation Reference Sheet

Appendix C Operations and Areas Inspected

Appendix D IFA Field Inspection Guide

Appendix D.1 Health Physics Inspection Details

Appendix E Findings and Observations

Appendix F Photographs

Appendix A IFA Team Meetings, Inspections and Interviews

Meeting Date	Topic	Attendees
5/31/06	The radioactive material authorizations (RWA, LASs, and SSAs) were reviewed, including the training requirements associated with the authorizations. Also discussed was the documentation related to the authorizations that PIs are expected to maintain. The timing of the inspection was discussed.	Christine Donahue, Marty White
6/29/06	The scope and purpose of the IFA was discussed. Topics included offsite work (not in the scope of this IFA), and the need to check: (1) the AHD processes against the documents, (2) emergency response signage, (3) how workers are protected when there is work on the system, and (4) oversight of subcontractor work. The two AHDs were reviewed and discussed. In addition, team member roles were discussed at the meeting. The timing of the inspection was discussed.	Betsy MacGowan, Matt Kotowski, Ron Madaras, Tom Caronna, Marty White, John Muhlestein

Appendix A – Team Meetings, Inspections and Interviews		
Inspection / Interview Date	Location	Participants
6/5/06	SAA in 50-6007, 50-6040, 50A-6238, and Microsystems Laboratory in 70A	Marty White, Nick Palaio
6/22/06	SSAs in 50B-6209 and 50-2155; LASs in 50A-2155, 50A-6114, 50B-6209, 50B-6216, 50B-6238	Christine Donahue, Marty White, Tom Weber
6/30/06	Microsystems Laboratory in B70A	Betsy MacGowan, Matt Kotowski, Tom Caronna, Ron Madaras, Marty White, Nick Palaio
7/14/06	Microsystems Laboratory in B70A	Gary Piermattei, Marty White, Nick Palaio
7/17/06	SSA & LAS in 50A-2155	Kris Szornel

Appendix B IFA Documentation Reference Sheet

DOCUMENT TYPE/TITLE	Reference (Doc #, dates, etc.)
Facility Permits / Authorizations	
Safety Analysis Documents (SADs) Final Safety Analysis Documents (FSADs)	Not applicable
Discharge permits (sewer, storm water, air)	Not applicable
NEPA/CEQA documents	Not applicable
Formal Work Authorizations	
Activity Hazard Documents (AHDs)	AHD 2014; LAM Research Model 4400 Plasma Etch System; 70A Microsystems Laboratory
	AHD GS1002; Microsystems Laboratory Furnace Systems; 70A Microsystems Laboratory
Radiological Work Authorizations (RWAs)	RWA 1150; 9/27/05; 50B-6209 (Inactive)
Radiological Work Permits (RWPs)	Not applicable
General License Authorizations (GLAs)	Not applicable
Sealed Source Authorizations (SSAs)	SSA 111; 2/6/06; 50B-6209
	SSA 115; 2/14/06; 50A-2155
	SSA 212; 3/8/05; 50A-2155
X-ray Authorizations (XAs)	Not applicable
Human Subjects	Not applicable
Biological Use Authorizations/Registration	Not applicable
Waste Management Group information on Satellite Accumulation Areas (SAAs) and Waste Accumulation Areas (WAAs)	6 SAAs (in B/50 & B/70A)
Low Activity Source Authorization	LAS L002; 3/14/06; 50B-6209, 50B-6216, 50B-6238, 50A-6114
	LAS L023; 2/6/06; 006-BTS, 50A-2155
Hazardous Work Authorization / Permits	
Confined Space Permit	Not applicable
Energized Work Permit (A and B)	Not applicable
Fire Safety Permit	Not applicable
Lock Out Tag Out	Not applicable
Surface Penetration Permit	Not applicable
Ultracentrifuge Use	Not applicable

 IFA Team Leader Signature

 Date

Appendix C Operations and Areas Inspected

Date	Building and Room	Auth. Type/ID	Operation/Work Area Description and Comments
6/5/06	50-6007	SAA	Empty SAA – in compliance
6/5/06	50-6040	SAA	Empty SAA – in compliance
6/5/06	50A-6238	SAA	Empty SAA – in compliance
6/5/06	70A-4445	SAA	SAA supports Microsystems Laboratory – in compliance
6/5/06	70A-4445	SAA	SAA supports Microsystems Laboratory – in compliance
6/5/06	70A-4457	SAA	SAA supports Microsystems Laboratory – in compliance
		RWA	RWA 1150 Inactive
6/22/06	50B-6209	SSA	SSA 111 – Sealed sources are used in the development of silicon detectors for colliding beam experiments at CERN
7/17/06	50A-2155	SSA	SSA 115 – Sealed sources are used to measure detector responses.
7/17/06	50A-2155	SSA	SSA 212 – The sealed source is used in the calibration and development of monolithic pixel silicon detectors
6/22/06	50B-6209, 50B-6216, 50B6238, 50A-6114	LAS	LAS L002 - After irradiation at the 88" cyclotron, detector parts are transported to B50A & B50B for study.
7/17/06	50A-2155	LAS	LAS L023 – After irradiation at the 88" cyclotron, detector parts are transported to B50A-2155 for study.
6/30/06, 7/14/06	70A-4435, 70A-4445, 70A-4457	AHD	AHD 2014 – LAM Research Model 4400 Plasma Etch System in Microsystems Laboratory. The Microsystems Laboratory is a semiconductor processing facility for the fabrication of silicon radiation detectors and integrated electronics.
6/30/06	70A-4435, 70A-4445, 70A-4457	AHD	AHD GS1002 – Microsystems Laboratory Furnace Systems. The Microsystems Laboratory is a semiconductor processing facility for the fabrication of silicon radiation detectors and integrated electronics.

Appendix D - Field Inspection Guide

Authorization Type: AHD

Date: 30-Jun-06

Location(s): Microprocessing Laboratory, B70A

Authorization Number/Reference: AHD 2014 & GS1002

REVIEWED

Administrative

	Yes	No	Not Obs/App
Authorization approved and signed	x		
Authorization current	x		
All users listed on authorization			x
All users trained in accordance with authorization requirements	x		
Authorization accurately reflects work being conducted	x		
Authorization posted / available in work area	x		
Other:			

Hazardous Work Permits

Confined Space Permit			x
Energized Work Permits (EWP - A, B)			x
Fire Safety Permit			x
Lock Out Tag Out (LOTO)			x
Energized Work Permits (EWP - A, B)			x
Permit to Penetrate Surface			x

Work Area Occupational and Environmental Safety and Health

Access and egress	x		
Biohazards			x
Chemical Hygiene and Safety	x		
Chemical Management System status	x		
Compressed gasses	x		
Confined space			x
Cryogenic			x
Electrical	x		
Energy	x		
Ergonomic considerations	x		
Exit Routes, Emergency Action Plans, and Fire Prevention Plans	x		
Elevated locations and guarding			x
Lasers			x
Lead	x		
Machine tools			x
PPE	x		
Pressure	x		
Soldering	x		
Thermal	x		
Walking and working surfaces	x		
Welding			x
Other Hazards:			

Radiation Protection

Radioisotope Journal up to date			x
Contamination/Inventory Control: meters, material storage, waste segregation, housekeeping			x
Exposure Control: shielding, dosimetry, PPE, food/drink			x
Posting & Labeling: rooms, sinks, equipment			x

Appendix D - Field Inspection Guide

		REVIEWED	
Equipment Authorization - Certification/calibration/logs	Yes	No	Not Obs/App
Autoclave			X
Biosafety Cabinet			X
Clean Room	X		
Crane Hoist			X
Eyewash / Safety Shower	X		
Fire Extinguishers	X		
Flammables Cabinet/Refrigerator			X
Fork Lift / Heavy Equipment Operator			X
Fume Hood			X
Glove Box			X
Hand and Shoe Counter			X
Local Exhaust System	X		
Monitoring / Alarm System	X		
Photoprocessing Equipment			X
Sonicator			X
Ultracentrifuge			X
Other			
Waste Management			
WAA compliance			X
SAA compliance	X		
Environmental Services			
Air emissions			X
Sanitary sewer discharge			X
Storage tanks - aboveground or underground			X
Storm water management			X
Treatment systems			X
Field Interviews			
Knowledge of authorizations, procedures, etc.	X		
Knowledge of safety systems	X		
On-the-job training	X		
Safety concerns, how to communicate concerns	X		
Comments			
Performed By: IFA Team		Date: 6/30/06	
Name / Signature			
Reviewed By: Marty White		Date: 6/30/2006	
Name / Signature IFA Team Leader			

Appendix D.1 Health Physics Inspection Details

From the IFA Appendix D Field Inspection Guide, the Health Physics SME reviewed the following areas (as applicable) for each of the Physics authorizations. Her comments follow:

		REVIEWED			
		Yes	No	Not	Obs/App
Administrative	Authorization approved and signed	X			
	Authorization current	X			
	All users listed on authorization	X			
	All users trained in accordance with authorization requirements	X**			
	Authorization accurately reflects work being conducted	X			
	Authorization posted / available in work area	X			
	Other:				
Radiation Protection	Radioisotope Journal up to date (SSJ)	X			
	Contamination/Inventory Control: meters, material storage, waste segregation, housekeeping	X*			
	Exposure Control: shielding, dosimetry, PPE, food/drink	X			
	Posting & Labeling: rooms, sinks, equipment	X			

*contamination control not an issue for these authorizations.

**To ensure that all users are trained in accordance with authorization requirements, each radiation worker listed on a specific authorization is assigned a 'role' in RADAR based on the type of work they will be performing. Examples include "unsealed material rad worker", "accelerator operator", and "sealed source user". Based on the selected 'role' for the worker, the required training classes are linked to the user's employee ID number. RADAR is tied to the HR-Training database and the records of required radiation safety training are transferred into the RADAR database daily. To meet 10CFR835 requirements, RADAR is programmed to require a two-year renewal for the radiation worker training classes. To ensure on-going compliance, RADAR training reports list those rad workers coming due in 3-months, 1-month and deficient. Renewals are on an annual or 18-month cycle depending on the hazard class of the authorization, to ensure that the two-year retraining requirement is met. If an employee cannot attend the retraining class, the alerts from RADAR are

designed to provide enough advance notice to prevent the employee from losing rad worker status. If an employee's training does expire, the name is flagged automatically by RADAR, the authorization cannot be renewed without removing the worker from the authorized users list. The Health Physicist then notifies the PI that the worker will be removed from authorized rad work until the training is completed.

Appendix E

Findings and Observations

Item No.	Building & Room #	Description of Finding (#'d items) or Observations (lettered items)	Regulation or Policy Citation	Recommendation or Corrective Action	Entered CATS? Y/N	Photo Ref.
1	70A, 4445	Respirator training expired for Nick Palaio	PUB 3000-24.4.3	Nick needs to take respirator training (EHS0310)	yes	
2	70A, 4445	AHD requires Fire Department training, and no training has taken place in a few years	AHD	Nick to coordinate training with Fire Department	yes	
3	70A, 4445	Electrical panels do not have 3' clearance in front (institutional issue)	PUB 3000-8.13.2	Have situation evaluated for options	yes	1, 2
4	70A, 4445	Electrical panels missing screws to hold on panels (institutional issue)	PUB 3000-8.13-1	Have Facilities replace screws	yes	3
5	70A, 4445	Fire extinguisher not serviced since 2004 (institutional issue)	PUB 3000-12.5	Have Facilities add area to list of fire extinguishers needing servicing & Fire Department add to list to check monthly	yes	4
6	70A, 4445	Unanchored shelf over 3' tall	PUB-3000 23.5.3	Have shelf anchored	yes	
A	70A, 4445	PI solders once or twice annually and has not had lead awareness training	PUB 3000-24.4.1	Recommend lead awareness training (EHS0243) for anyone who solders	yes	





Appendix E

Findings and Observations

Item No.	Building & Room #	Description of Finding (#'d items) or Observations (lettered items)	Regulation or Policy Citation	Recommendation or Corrective Action	Entered CATS? Y/N	Photo Ref.
B	70A, 4445	AHD includes gas no longer used (phosphorus oxychloride)	AHD	Update AHDs	yes	
C	70A, 4445	Personnel use face shield but not goggles when adding liquid chemicals to baths	PUB 3000-19.6.1	Recommend that personnel use goggles in addition to face shield	no	
D	70A, 4445	Difficult access to HVAC when maintenance needed (institutional issue)	none	Have situation evaluated for options	yes	
E	70A, 4445	Dangling light fixture and uncovered electrical box in ceiling (institutional issue)	PUB 3000-8.13.1	Have Facilities remove or mount light and cover junction box	yes	5,6
F	70A, 4445	Access and egress confusing	Fire code	Improve signage by marking "equipment access only", "emergency use only", and exits	yes	
G	70A, 4445	Little assurance of subcontractors doing safe work (institutional issue)	none	Needs LBNL management attention	yes	

Appendix F Photographs

IFA Report Guidance: Apply 'thumbnail' images of the appraisal photos (where available) in the order of the numbered findings and observations from Appendix E.

Findings and Observation Photos			
1	2	3	4
			
5	6		
